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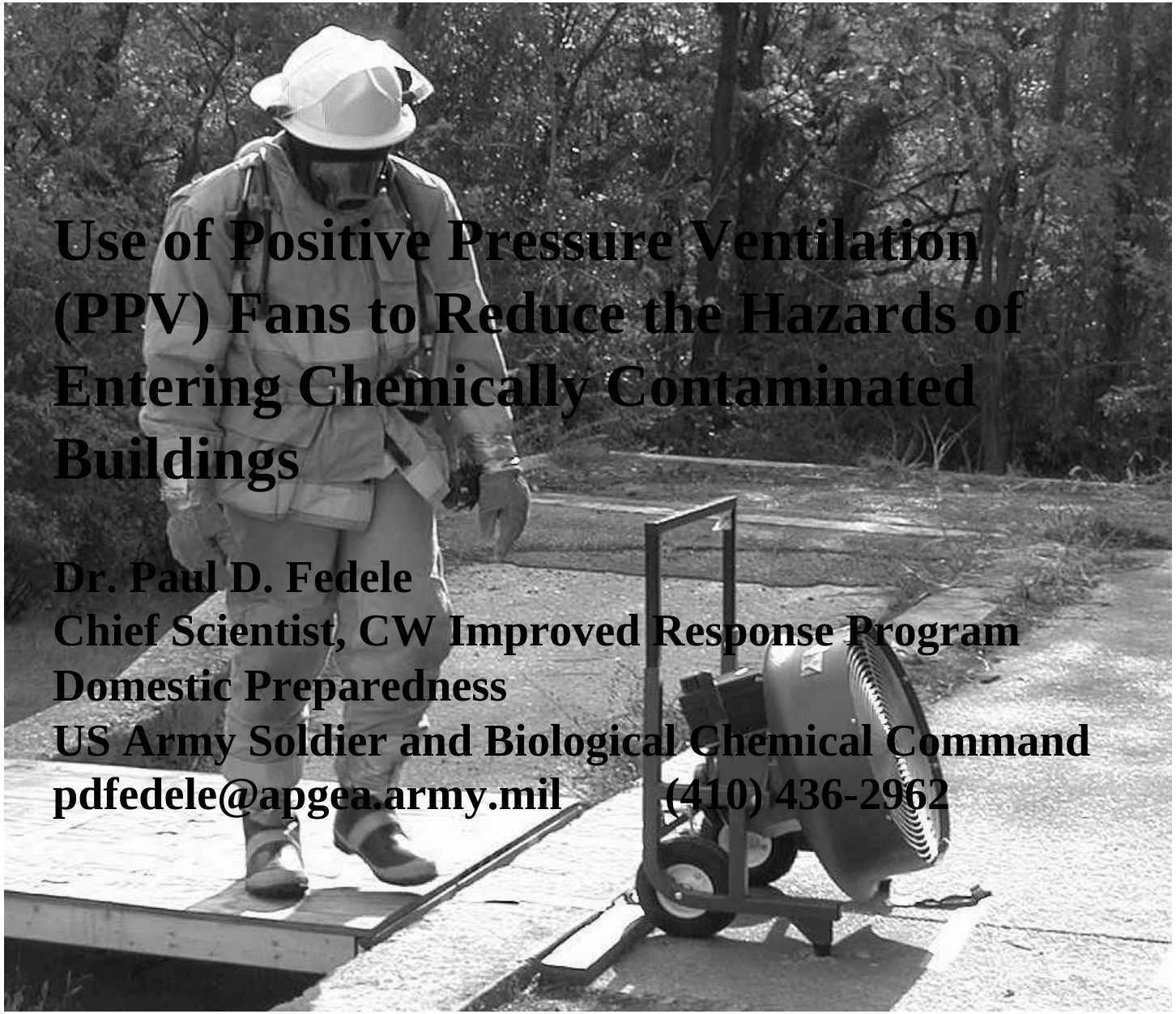

Use of Positive Pressure Ventilation (PPV) Fans to Reduce the Hazards of Entering Chemically Contaminated Buildings

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PPV Study Background

- Fire fighters often carry and use PPV fans for effective removal of hazardous airborne smoke from buildings.

- This technical study demonstrates the effectiveness of PPV fans in reducing vapor concentrations and hazards faced by firefighters performing quick rescue in chemical vapor contamination.

Study Objectives

- Demonstrate the effectiveness of PPV fans in removing chemical vapors from buildings

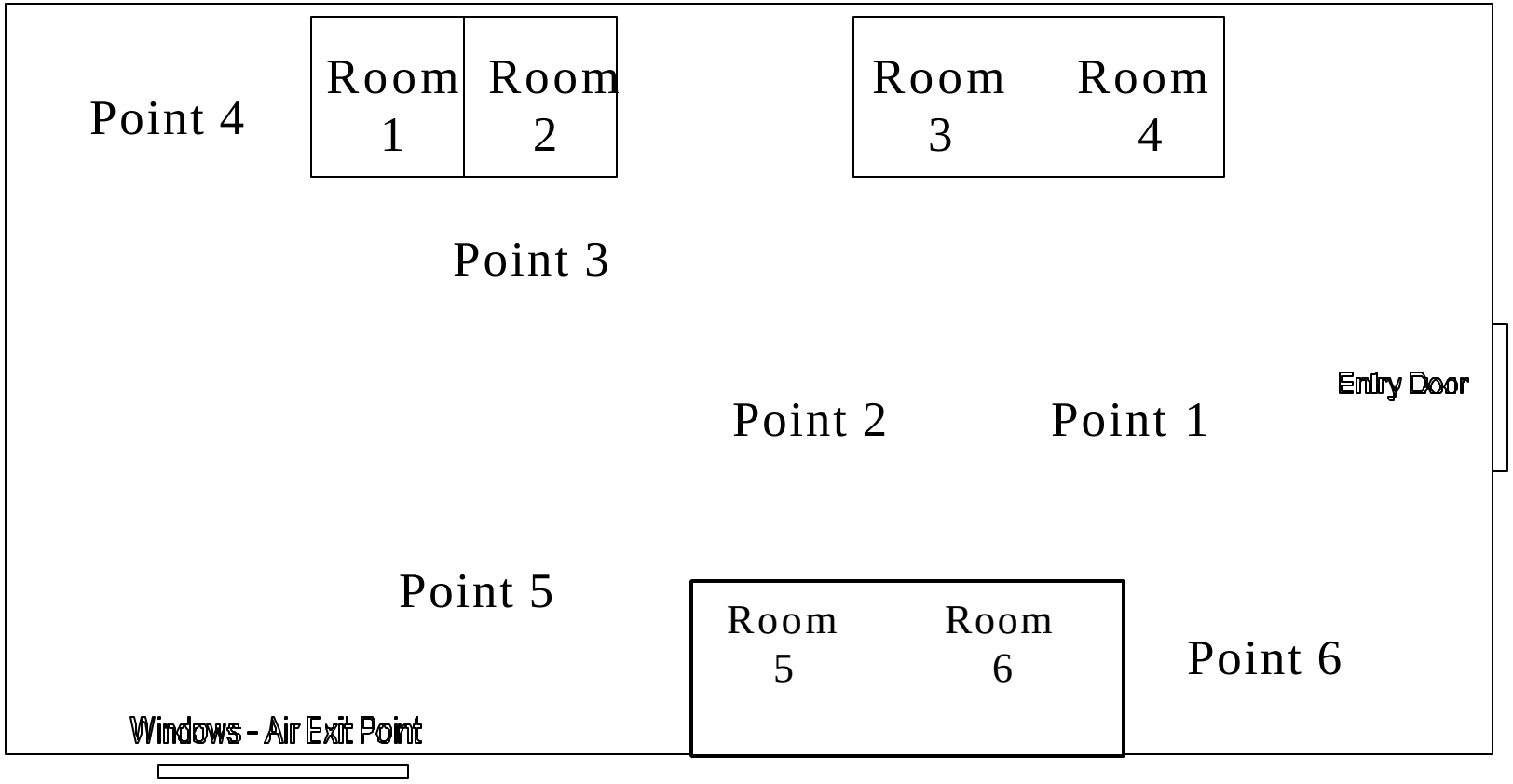
Study Objectives

- Assess the increased protection that fire fighters obtain using PPV fans during a quick rescue

Experimental Approach

- Use available warehouse at Edgewood Area of Aberdeen Proving Ground
- Set initial simulant vapor concentration and measure concentration decay using PPV fans
- Use Man-In-Simulant Test (MIST) procedures to measure vapor hazards while firefighters perform quick rescue in the warehouse using PPV equipment

Configuration of Warehouse



95,000 cubic foot warehouse: floor 110 ft by 50 ft

PPV Fan Configurations

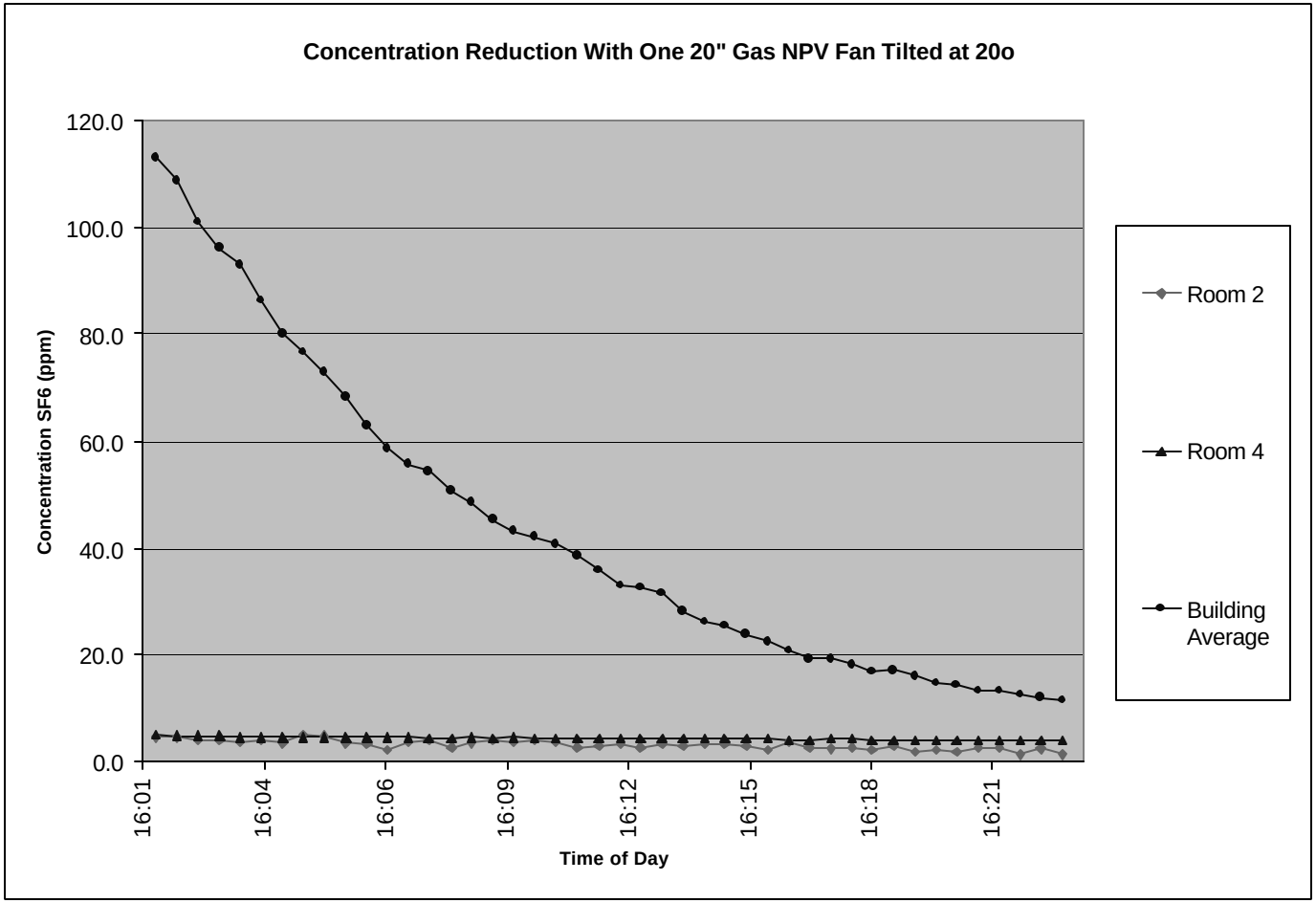
Single fan and double stacked fan application

PPV Fan Configurations

Double fans applied in series

Single fan applied in negative pressure mode

Example of Concentration Reduction



Vapor Concentration Reduction

PPV equipment can purge the majority of chemical vapors from a building after 10 minutes of use

Firefighter Protection: MIST Trials

Firefighters don MIST samplers and dress in their standard turnout gear

Quick Rescue in the Warehouse

160 lb rescue dummy is ‘saved’ in warehouse

MIST Analysis

- MIST samplers recovered after the rescue
- Assessed vapor hazards are compared to results of MIST trials for standard turnout gear assessment

When firefighters use PPV during quick rescue, they receive 3 to 26 times more protection than with standard turnout gear alone, depending on PPV use.

PPV Application Conclusions

- PPV fans dramatically decrease interior vapor concentrations
- PPV fans significantly increase firefighter protection, over that offered by standard turnout gear,during a quick rescue in chemical agent vapor contamination
- Before using PPV equipment, downwind hazards must be considered
- Bigger fans are better: two fans are better than one.

Further CW IRP Information

Further details are available in "Use of Positive Pressure Ventilation (PPV) Fans to Reduce the Hazards of Entering Chemically Contaminated Buildings".
A report available on line, under CWIRP Reports, at the web site:

http://www2.sbccom.army.mil/hld/index.htm


Questions?